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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/655,778	09/05/2003	Thomas L. Beck	7193	6594

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EXAMINER	
HAMO, PATRICK	

ART UNIT	PAPER NUMBER
3746	

NOTIFICATION DATE	DELIVERY MODE
07/09/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

IPAdmin@reinhartlaw.com

Office Action Summary	Application No.	Applicant(s)	
	10/655,778	BECK ET AL.	
	Examiner	Art Unit	
	PATRICK HAMO	3746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 June 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *17-21, 23-26 and 69-74* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *20,25 and 74* is/are allowed.

6)☒ Claim(s) *17-19,21,23,24,26 and 69-73* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

This action is in response to amendments filed on Apri 19, 2010.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Deleted: 2

Claims 17, 18, 19, 21, 23-24, 26, and 69-73 are rejected under 35 U.S.C. 103(a) as being unpatentable over Birckhead et al., US 2002/0074127, now US 6,536,522, in view of Odachi et al., US 6,869,272.

In regard to independent claim 17:

Birckhead discloses a pump control system for controlling a progressing cavity pump 60 for transferring fluid within a system, whereby the performance characteristics of the pump are controlled by a controller 25 (col. 4, lines 34-64). Birckhead does not disclose that the control method is accomplished without downhole sensors and in the manner claimed. However, Odachi teaches a control method for controlling a motor driving a compressor wherein an estimation unit 51 measures voltage and current supplied to a motor 1 and uses this information to determine the speed via speed control unit 61. The measured current also determines the torque via torque control unit

52 (also see Abstract) and determines the load required of the compressor so that the torque and speed inputs can be adjusted by command signals to more efficiently run the compressor in response to the performance value corresponding to load (col. 1, line 63 - col. 2, line 27). The only inputs to determine the load on the compressor are the actual current and voltage. These inputs are used in a real-time basis to determine what the command speed and torque should be (constant speed or constant torque, low- or high- speed or torque) and are used in a closed loop system as seen in fig. 4. It would have been obvious to a person having ordinary skill in the art to have modified the control system of Birckhead with the system of Odachi that identifies situations in which motor parameters need to be adjusted to keep the fluid transfer device operating efficiently.

In regard to independent claim 69:

Birckhead discloses a pump control system for controlling a progressing cavity pump 60 for transferring fluid within a system, whereby the performance characteristics of the pump are controlled by a controller 25 (col. 4, lines 34-64). Birckhead does not disclose that the control method is accomplished without downhole sensors and in the manner claimed. However, Odachi teaches a control method for controlling a motor driving a compressor wherein an estimation unit 51 measures voltage and current supplied to a motor 1 and uses this information to determine the speed via speed control unit 61. The measured current also determines the torque via torque control unit 52 (also see Abstract) and determines the load required of the compressor so that the

torque and speed inputs can be adjusted by command signals to more efficiently run the compressor in response to the performance value corresponding to load (col. 1, line 63 - col. 2, line 27). The only inputs to determine the load on the compressor are the actual current and voltage. These inputs are used in a real-time basis to determine what the command speed and torque should be (constant speed or constant torque, low- or high-speed or torque) and are used in a closed loop system as seen in fig. 4. It would have been obvious to a person having ordinary skill in the art to have modified the control system of Birckhead with the system of Odachi that identifies situations in which motor parameters need to be adjusted to keep the fluid transfer device operating efficiently.

In regard to claims 18, 21, 23 and 26:

Birckhead discloses a step of using progressing cavity pump performance values to produce command signals comprises the steps of: selecting a progressing cavity pump performance parameter (head pressure, col. 4, ll. 34-36) to control; determining a setpoint (preset or historically stored values, col. 4, ll. 44-48) for the selected progressing cavity pump performance parameter; calculating a control signal using the setpoint value of the selected progressing cavity pump performance parameter (col. 4, ll. 49-50); and calculating the command signals from the control signal. It would have been obvious to apply Odachi's teaching with reference to compressor load to the pressure in Birckhead's pump as a pump performance value to regulate.

In regard to claims 19 and 24:

Birckhead, though not explicitly disclosing that the pump parameter is pump flow, discloses that the pressure is adjusted by controlling the pump flow. Therefore, it would have been obvious to a person having ordinary skill in the art to have substituted setpoints and measurements for pump flow as opposed to pressure to achieve the same, predictable, result of controlling the pump of Birckhead. The relationship between pump flow is such that regulating pump flow as a parameter would achieve substantially the same objective. Therefore, it would have been obvious to one of ordinary skill in the art to use pump flow as the performance parameter to be set and measured.

In regard to claims 70-72:

Birckhead in view of Odachi teach all of the limitations substantially as claimed, notably means for using progressing cavity pump performance values to produce one or more command signals for controlling the speed of the progressing cavity pump (col. 4, ll. 49-50). Neither reference explicity discloses using the progressing cavity pump performance values to produce command signals includes means for calculating a feedback signal indicative of the difference between a current value of a selected progressing cavity pump performance parameter and a setpoint value of the selected progressing cavity pump performance parameter, and means for calculating the command signals from the feedback signal. However, feedback control as described in the claimed limitations above are typical of elementary feedback control systems, such as the feedback control system for estimated speed input in Odachi et al. (see fig. 4). It

would have been obvious to one of ordinary skill in the art that Birckhead, having sensors to measure actual production values and designed to set setpoint values, would use such feedback control as claimed by the applicant.

Claim 73 is rejected under 35 U.S.C. 103(a) as being unpatentable over the references applied to claim 69 above in view of Kawabata et al., 6,244,831.

Birckhead discloses all of the limitations substantially as claimed except means using the progressing cavity pump performance values to produce command signals includes means for calculating a feedforward signal by predicting a value of mechanical input to the progressing cavity pump when operating with a selected progressing cavity pump performance value at a setpoint value, and means for calculating the command signals from the feedforward signal.

As discussed above, Birckhead discloses sensors that measure actual performance values and is designed to set setpoint values, lending itself to feedback control. Kawabata teaches a feedforward control method for a pump, identifying a target value that undergoes a subtraction cycle that predicts deviation between a target value and a setpoint value to identify the proper setpoint value (col. 18, ll. 28-55), that would be obvious to one of the art to adapt to the control system of Birckhead to achieve the predictable result of using feedforward control to predict and obviate deviations between setpoint and target values.

Allowable Subject Matter

Claims 20, 25 and 74 are allowed.

Response to Arguments

Applicant's arguments filed April 19, 2010 have been fully considered but they are not persuasive.

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Applicant argues that Birckhead teaches away from the claimed invention because of its use of downhole sensors, however the basis of the rejection is that one of ordinary skill would have found it obvious to eliminate the sensors with the self-contained motor control of Odachi.

In response to applicant's argument that the motor and compressor of Odachi is nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, a field is not so narrow as to only include downhole progressing cavity pumps. Birckhead, Odachi and the presently claimed invention all deal with the motor control of fluid transfer devices, and as such have distinct similarities such as load considerations and application of voltage and current in control of motor torque and speed such that one of ordinary skill would have found it obvious to use the teachings of Odachi in the field of refrigerant compressors to modify the device of Birckhead in the field of downhole pumps.

Applicant argues that the torque and speed requirements of the claimed PCP will change from time to time, and that Odachi's motor does not experience this change. However, Odachi makes very clear in the cited passage above that the requirements change in response to how much or if residual refrigerant is left in the compressor, and this is the primary catalyst for load considerations in Odachi's control. An initial pre-determined constant torque does not change this result, as the actual applied torque is still measured, compared to the torque input, and a command sent to the motor to change the voltage or current to correct if there's a discrepancy, all done in real-time. Therefore, the rejection stated above is maintained.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PATRICK HAMO whose telephone number is (571)272-3492. The examiner can normally be reached on M-F 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Devon Kramer can be reached on 571-272-7118. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Charles G Freay/
Primary Examiner, Art Unit 3746

/Patrick Hamo/
Patent Examiner, AU 3746